AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for rendering a digital image having surface reflectance properties, said method comprising the steps of:

creating a parametric texture map that comprises parameters for an equation that defines a homogeneous surface structure in a manner in which the appearance of the surface structure includes surface reflectance properties, wherein said parametric texture map does not include variables representing surface position; and

rendering a digital image using said parametric texture map.

2. (Original) The method of claim 1 wherein said creating step further comprises:

creating said parametric texture map such that it models a surface reflectance function defining said surface reflectance properties of said surface structure.

3. (Original) The method of claim 1 wherein said surface reflectance properties vary in response to a light direction vector and a view direction vector.

4. (Original) The method of claim 1 wherein said parametric texture map comprises at least four independent variables.

5. (Original) The method of claim 1 wherein said parametric texture map comprises at least two independent variables for defining a light direction vector for said surface reflectance properties.

6. (Original) The method of claim 1 wherein said parametric texture map comprises at least two independent variables for defining a view direction vector for said surface reflectance properties.

7. (Original) The method of claim 1 wherein said parametric texture map comprises a plurality of texels and wherein said parametric texture map further comprises a plurality of coefficients for each texel, said plurality of coefficients defining lighting characteristics for varying views of the respective texel.

8. (Original) The method of claim 1 wherein said parametric texture map comprises at least two independent variables for defining a half-angle vector for said surface reflectance properties.

9. (Original) The method of claim 1 wherein said parametric texture map comprises at least two independent variables for defining a difference vector for said surface reflectance properties.

10. (Original) The method of claim 1 wherein said equation models a Bidirectional Reflectance Distribution Function (BRDF).

11. (Currently Amended) A method for creating a parametric texture map for modeling surface reflectance properties for use in rendering a digital image having said surface reflectance properties, said method comprising the steps of:

for each texel of a texture, sampling surface reflectance data for a homogeneous surface and determining at least one coefficient of said parametric texture map based at least in part on the sampled surface reflectance data; and

creating said parametric texture map, wherein said parametric texture map determines values for pixels of said digital image using an equation that is not a function of said pixels' surface positions.

12. (Original) The method of claim 11 wherein said determining step comprises:

determining six coefficients of said parametric texture map based at least in part on the sampled surface reflectance data.

13. (Original) The method of claim 11 wherein said parametric texture map comprises at least four independent variables.

14. (Original) The method of claim 11 wherein said parametric texture map comprises at least two independent variables for defining a light direction vector for said surface reflectance properties.

15. (Original) The method of claim 11 wherein said parametric texture map comprises at least two independent variables for defining a view direction vector for said surface reflectance properties.

16. (Original) The method of claim 11 wherein said parametric texture map comprises at least two independent variables for defining a half-angle vector for said surface reflectance properties.

17. (Original) The method of claim 11 wherein said parametric texture map comprises at least two independent variables for defining a difference vector for said surface reflectance properties.

18. (Original) The method of claim 11 wherein said step of determining further comprises:

performing a least squares fit algorithm to the sampled surface reflectance data.

19. (Currently Amended) A computer graphics system including a graphics processor and display, the system comprising:

a parametric texture map executable by said graphics processor, wherein said parametric texture map models a surface reflectance function defining surface reflectance properties for a surface structure, and wherein said surface reflectance function comprises a Bidirectional Reflectance Distribution Function (BRDF).

20. (Original) The system of claim 19, wherein said parametric texture map comprises four independent variables.

21. (Original) The system of claim 20, wherein said parametric texture map comprises at least two independent variables for defining a light direction vector for said surface reflectance function.

22. (Original) The system of claim 19 wherein said parametric texture map comprises at least two independent variables for defining a view direction vector for said surface reflectance function.

23. (Original) The system of claim 19 wherein said parametric texture map comprises at least two independent variables for defining a half-angle vector for said surface reflectance function.

24. (Original) The system of claim 19 wherein said parametric texture map comprises at least two independent variables for defining a difference vector for said surface reflectance function.

25. (Original) The system of claim 19 wherein said parametric texture map is executable by said graphics processor to render said surface structure having surface reflectance properties defined by said surface reflectance function in substantially real-time.

26. (Canceled)

27. (Previously Presented) A system for rendering a digital image utilizing a texture map, said system comprising:

a texture map data structure including a function for representing a texture map of a plurality of texels, said function evaluating at least two independent variables for defining an illumination vector and at least two independent variables for defining a view vector.

28. (Original) The system of claim 27 wherein said texture map data structure models a surface reflectance function for a surface structure.

29. (Original) The system of claim 27 wherein said texture map data structure further comprises a plurality of coefficients for each texel of said texture map, said plurality of coefficients defining lighting characteristics for varying views of each respective texel.

30. (Original) The system of claim 27 further comprising:

a rendering algorithm, said rendering algorithm being operable to calculate texel display value using said texture map data structure.

31. (Original) The system of claim 30 wherein said rendering algorithm is operable to render a 3D object having surface reflectance properties as defined by said texture map data structure.

32. (Previously Presented) A system for rendering a digital image utilizing a texture map, said system comprising:

a texture map data structure including a function for representing a texture map of a plurality of texels, said function evaluating at least two independent variables for defining a half-angle vector and at least two independent variables for defining a difference vector.

33. (Original) The system of claim 32 wherein said texture map data structure models a surface reflectance function for a surface structure.

34. (Original) The system of claim 32 further comprising:

a rendering algorithm, said rendering algorithm being operable to calculate texel display value using said texture map data structure.

35. (Original) The system of claim 34 wherein said rendering algorithm is operable to render a 3D object having surface reflectance properties as defined by said texture map data structure.

36. (Previously Presented) A method comprising:

using a texture map that includes a function for use in rendering a digital image having surface reflectance properties, wherein said function evaluates more than two variables directed to surface reflectance properties.

37. (Previously Presented) The method of claim 36 wherein said function evaluates at least two independent variables for defining an illumination vector and at least two independent variables for defining a view vector.

38. (Previously Presented) The method of claim 36 wherein said function evaluates at least two independent variables for defining a half-angle vector and at least two independent variables for defining a difference vector.

39. (Previously Presented) A system comprising:

a texture map that includes a function for use in rendering a digital image, wherein said function evaluates more than two variables relating to surface reflectance properties of said digital image.

40. (Previously Presented) The system of claim 39 wherein said function evaluates at least two independent variables for defining an illumination vector and at least two independent variables for defining a view vector.

41. (Previously Presented) The system of claim 39 wherein said function evaluates at least two independent variables for defining a half-angle vector and at least two independent variables for defining a difference vector.

42. (Previously Presented) A method comprising:

receiving more than two independent variables relating to surface reflectance properties of a digital image to be rendered; and

using a function of a texture map for processing the received variables to render the digital image having surface reflectance properties in accordance with the received variables.

43. (Previously Presented) The method of claim 42 wherein said using said function comprises:

said function evaluating at least two independent variables for defining an illumination vector and at least two independent variables for defining a view vector.

44. (Previously Presented) The method of claim 42 wherein said using said function comprises:

said function evaluating at least two independent variables for defining a half-angle vector and at least two independent variables for defining a difference vector.

45. (Previously Presented) A system comprising:

a texture map that includes a Bidirectional Reflectance Distribution Function (BRDF) for use in rendering a digital image, wherein said BRDF includes more than two variables relating to surface reflectance properties of said digital image.

46. (Previously Presented) The system of claim 45 wherein said more than two variables are selected from the group consisting of:

variables for defining an illumination vector, variables for defining a view vector, variables for defining a half-angle vector, and variables for defining a difference vector.

47. (Previously Presented) The system of claim 45 wherein said more than two variables includes at least two independent variables for defining an illumination vector and at least two independent variables for defining a view vector.

48. (Previously Presented) The system of claim 45 wherein said more than two variables includes at least two independent variables for defining a half-angle vector and at least two independent variables for defining a difference vector.

49. (Previously Presented) Computer-executable software code stored to a computer-readable medium, said computer-executable software code comprising:

code for receiving at least four independent surface reflectance property variables; and

code for using a function included in a texture map for rendering a digital image, wherein said function evaluates the received at least four independent surface reflectance property variables to render said digital image having proper surface reflectance properties.

50. (Previously Presented) The method of claim 49 wherein said at least four independent surface reflectance property variables comprise:

at least two independent variables for defining an illumination vector; and

at least two independent variables for defining a view vector.

51. (Previously Presented) The method of claim 49 wherein said at least four independent surface reflectance property variables comprise:

at least two independent variables for defining a half-angle vector; and

at least two independent variables for defining a difference vector.

52. (New) The method of claim 1 wherein said parametric texture map defines said surface structure according to one selected from the group consisting of:

$PTM(v_u, v_v, l_u, l_v) = A(v_u, v_v)l_u^2 + B(v_u, v_v)l_v^2 + C(v_u, v_v)l_u l_v + D(v_u, v_v)l_u + E(v_u, v_v)l_v + F(v_u, v_v)$, wherein A, B, C, D, E, and F are coefficients, v_u and v_v are variables representing view direction, and l_u and l_v are variables representing light direction, and

$PTM(H_u, H_v, D_u, D_v) = A(H_u, H_v)D_u^2 + B(H_u, H_v)D_v^2 + C(H_u, H_v)D_u D_v + D(H_u, H_v)D_u + E(H_u, H_v)D_v + F(H_u, H_v)$, wherein A, B, C, D, E, and F are coefficients, H_u and H_v are variables representing a half-angle vector, and D_u and D_v are variables representing a difference vector.

53. (New) A method for rendering a digital image having surface reflectance properties, said method comprising:

creating a parametric texture map that comprises parameters for an equation that defines a surface structure in a manner in which the appearance of the surface structure includes surface reflectance properties, wherein said equation models a Bidirectional Reflectance Distribution Function (BRDF); and

rendering a digital image using said parametric texture map.

54. (New) A method for creating a parametric texture map for modeling surface reflectance properties for use in rendering a digital image having said surface reflectance properties, said method comprising:

for each texel of a texture, sampling surface reflectance data and determining at least one coefficient of said parametric texture map based at least in part on the sampled surface reflectance data, wherein said step of determining further comprises performing a least squares fit algorithm to the sampled surface reflectance data.